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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/221,539	12/28/98	CHENG	W 1010-1

MOBIL OIL CORP
RONALD A BLEEKER
3225 GALLOWES ROAD
FAIRFAX VA 22037

IM22/1025

EXAMINER

PREISCH, N

ART UNIT	PAPER NUMBER
1764	13

DATE MAILED: 10/25/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/221,539

Applicant(s)

Cheng et al.

Examiner

Nadine Preisch

Group Art Unit

1764



☒ Responsive to communication(s) filed on Jun 2, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-25 is/are pending in the application.

Of the above, claim(s) 13-25 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-12 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Removal of Finality of Office Action

The “finality” of the office action mailed 6-15-00 is removed in view of applicants’ amendment mailed 6-2-00. Since the amendment was filed prior to the mailing of the office action, a new office action follows.

Election/Restriction

Applicants’ election with traverse of Group I in Paper No. 12 is acknowledged. The traversal is on the ground(s) that there is not sufficient evidence for the examiner’s proposed alternate use. This is not found persuasive because applicants have not provided sufficient reasons why the proposed alternate use can not be accomplished.

The requirement is still deemed proper and is therefore made FINAL.

Removal of Objection to the Specification

Applicants’ amendments filed 6-2-00 are sufficient to overcome the objection to the specification.

Removal of Claim Objections

Applicants’ amendments filed 6-2-00 are sufficient to overcome the objections to the claims.

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Claim Rejections - 35 U.S.C. § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 5, 6 and 8 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Beck et al.(4,588,702).

The reference of Beck et al.(4,588,702) discloses a process of cracking a hydrocarbon feed containing a sulfur containing compound in the presence of a catalyst. See column 14, lines 13-14 and column 9, lines 29-31. The process produces a high gasoline product. See column 11, line 1. The catalyst includes a USY component containing lanthanum and/or cerium. See column 15, line 61 and column 18, lines 41-42. The amount of rare earth oxides based on the total weight

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of the catalyst is 0.5 to 2%. See column 18, lines 41-51. The zeolite component may optionally be combined with a matrix material. See column 19, lines 64-66. An acceptable unit cell size ranges from 23.3-24.7 angstroms. See column 16, lines 46-49. The reference further teaches that the catalyst is separated, stripped, regenerated in the presence of oxygen and recycled back to the reaction zone. See column 27, line 51, column 28, line 23, column 29, lines 63-64 and column 30, lines 23-30.

The reference of Beck et al.(4,588,702) succeeds at disclosing a cracking process which results in the production of a gasoline with steps and catalyst components corresponding to those claimed by applicants.

It is noted that the reference does not refer to a reduction in the sulfur concentration of the feed. However, the reduction sulfur in the feed is considered to be inherent in the process because the same feed is contacted with the same catalyst and would inherently produce the same reduction in sulfur content.

Applicants' process is anticipated by the reference of Beck et al.(4,588,702) because it discloses the same process steps/catalyst claimed by applicants.

In addition, the presently claimed desulfurization would obviously have been provided as a result of the operation of the Beck et al.(4,588,702) process.

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Claim Rejections - 35 U.S.C. § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claim 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beck et al.(4,588,702) in view of Kugler (4,944,864).

-See teachings of Beck et al.(4,588,702) above.

A difference is noted between the reference of Beck et al.(4,588,702) and applicants' claimed invention. The reference does not disclose the use of a vanadium containing catalyst.

The reference of Kugler (4,944,864) is cited to show that it is known in the art that vanadium contaminants in a hydrocarbon feed which remain on a catalyst during regeneration are oxidized and that the oxidized vanadium compounds become mobile and react with the zeolite components of the catalyst. As a result, the regenerated catalyst contains vanadium. See column 4, lines 13-27.

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The reference of Kugler succeeds in disclosing the concept that regenerated catalysts which are recycled in processes involving the treatment of vanadium containing feeds contain a vanadium component resulting from contamination during the regeneration process.

Since the reference of Beck et al.(4,588,702) discloses a vanadium containing feed and a catalyst regeneration, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a vanadium containing catalyst because the reference of Kugler teaches that it is known in the art that regenerated catalysts recycled for further cracking contain vanadium components. Applicants have not shown anything unexpected with respect to the use of a catalyst containing a vanadium component.

Claim Rejections - 35 U.S.C. § 103

Claims 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beck et al.(4,588,702) in view of Tan-no et al.(5,646,082) and Kugler (4,944,864).

-See teachings of Beck et al.(4,588,702) above.

Several differences are noted between the reference of Beck et al.(4,588,702) and applicants' claimed invention. The reference does not disclose the specific unit cell size or $\text{SiO}_2/\text{Al}_2\text{O}_3$ ratio of the USY composition. In addition, the reference does not disclose the use of a vanadium containing catalyst.

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The reference of Tan-no et al.(5,646,082) is cited to show that it is conventional in the art to crack a feed in the presence of a USY containing a rare earth with a unit cell size of 24.45-24.55 and a $\text{SiO}_2/\text{Al}_2\text{O}_3$ molar ratio of 5-11. See column 2, lines 55-60.

The reference of Kugler (4,944,864) is cited to show that it is known in the art that vanadium contaminants in a hydrocarbon feed which remain on a catalyst during regeneration are oxidized and that the oxidized vanadium compounds become mobile and react with the zeolite components of the catalyst. As a result, the regenerated catalyst contains vanadium. See column 4, lines 13-27.

The reference of Kugler succeeds in disclosing the concept that regenerated catalysts which are recycled in processes involving the treatment of vanadium containing feeds contain a vanadium component resulting from contamination during the regeneration process.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the unit cell size and the $\text{SiO}_2/\text{Al}_2\text{O}_3$ ratio disclosed by the reference of Tan-no et al.(5,646,082) for the USY catalyst used in the Beck et al. process because the reference of Tan-no et al.(5,646,082) illustrates that such a unit cell size and a $\text{SiO}_2/\text{Al}_2\text{O}_3$ ratio are conventional in the art for cracking hydrocarbon feedstocks. Applicants have not shown anything unexpected with respect to the claimed unit cell size or $\text{SiO}_2/\text{Al}_2\text{O}_3$ of the USY component.

Since the reference of Beck et al.(4,588,702) discloses a vanadium containing feed and a catalyst regeneration, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a vanadium containing catalyst because the reference of Kugler

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teaches that it is known in the art that regenerated catalysts recycled for further cracking contain vanadium components. Applicants have not shown anything unexpected with respect to the use of a catalyst containing a vanadium component.

Claim Rejections - 35 U.S.C. § 103

Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beck et al.(4,588,702) in view of Occelli (4,615,996).

-See teachings of Beck et al.(4,588,702) above.

A difference is noted between the reference of Beck et al.(4,588,702) and applicants' claimed invention. The reference of Beck et al.(4,588,702) is silent with respect to the catalyst particle size.

The reference of Occelli (4,615,996) is cited for the general teaching that it is conventional in the art to use catalysts with particle sizes of less than 75 microns in FCC processes. See column 1, lines 25-30 and lines 35-40.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a catalyst particle size of less than 75 microns in the Beck et al. process because the reference of Occelli (4,615,996) illustrates that such catalyst particle sizes are conventional in the art for hydrocarbon cracking. Applicants have not shown anything unexpected with respect to the size of the catalyst particles.

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In addition, the particle size is not considered to be a patentable distinction over the applied art because changes in size are not invention of a rule. In re Rose, 105 USPQ 237 (CCPA 1955).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

This is a provisional obviousness-type double patenting rejection.

Claims 1-4 and 6-12 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2 and 4-12 of copending Application No. 09/221,540. Although the conflicting claims are not identical, they are not patentably distinct from each other because both applications are drawn to a process of reducing sulfur in a catalytically cracked petroleum containing organosulfur compounds in the presence of a catalyst containing a first metal which is on the interior pore structure of a molecular sieve and a second metal component.

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Several differences are noted between the present claims and the claims of copending Application No. 09/221,540. Present claim 1 includes a second metal component comprising at least one rare earth component whereas claim 1 of copending Application No. 09/221,540 includes a second metal component comprising cerium. Present claim 6 includes a second metal amount of 1-10 weight percent whereas copending Application No. 09/221,540 includes a second metal amount of 0.5-10 weight percent.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to select cerium as the second metal component in claim 1 of the present application because cerium is metal which reads on applicants' rare earth component limitation. Applicants' include cerium as a further limitation in the present dependent claims. As a result, the cerium limitation in copending Application No. 09/221,540 appears to read on the subject matter claimed in the present application.

In addition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select any second metal amount overlapping the amount claimed in copending Application No. 09/221,540 because it has been held that in the case where claimed ranges overlap, a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

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Response to Arguments

Applicants' arguments filed 6-2-00 have been fully considered but they are not persuasive.

Applicants argue 1) Beck does not anticipate applicants' claims because there is nothing in Beck which indicates a lanthanum component is present in the interior structure of the molecular sieve in an oxidation state greater than 0; 2) there is nothing in Beck which indicates the use of the metals vanadium, iron, cobalt or zinc within the interior pore structure of the molecular sieve component which these being in an oxidation state greater than 0; 3) there is no incentive to include vanadium in the zeolite component of a cracking catalyst; and 4) the prior art of Kugler teaches away from including vanadium in a catalyst because the presence of vanadium is undesirable.

In response to applicants' argument 1), the lanthanum component is considered to be present in the "interior" of the zeolite because in a less preferred embodiment, lanthanum is impregnated "into" the matrix. See column 8, lines 67-68. The impregnation into the matrix would provide lanthanum in the interior pore structure. Furthermore, the exchange would provide a lanthanum cation with an oxidation state greater than 0. The fact that the oxidation state may change during the process does not take away from the fact that at the beginning of the process, lanthanum is present with an oxidation state greater than 0.

In response to applicants' argument 2), Beck et al. suggests that vanadia is immobilized in the catalyst in column 10, line 10. The reference further teaches that metals (vanadium) can be

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deposited in the pores. See column 8, lines 63-66. Since the process is operated with vanadia trapped in the pores, it is considered to read on applicants' catalyst containing vanadium in the pores.

In response to applicants' arguments 3) and 4), the reference of Beck et al.(4,588,702) illustrates that a process continues despite the presence of vanadium in the catalyst. It is conceded that the presence of vanadium is not desirable. However, that fact that vanadium is undesirable does not take away from the teaching that it is present in catalysts used in the process of treating vanadium containing feeds. The reference of Kugler was cited to illustrate the fact that it is known that catalysts used in the treatment of vanadium feeds "will" contain vanadium due to contamination. Contrary to applicants' assertions, the secondary reference of Kugler was not used as a teaching to show the desirability of adding vanadium, but rather to illustrate that catalysts used in the treatment of vanadium containing feeds will contain vanadium. In the case of Beck et al.(4,588,702), a vanadium feed is utilized and as a result the catalyst will contain vanadium. Applicants' claims containing vanadium limitations do not overcome the prior art because it is fairly suggests that vanadium is present in prior art catalysts.

See the modified rejection above in response to applicants' arguments pertaining to the double patenting rejection.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nadine Preisch whose telephone number is (703) 305-2667. The examiner can normally be reached on Monday through Thursday from 7:30 am to 6:00 pm.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

October 23, 2000

N.P.

N.P.

**NADINE PREISCH
ART UNIT 1764**

Nad Pre